

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A method of making hollow, reinforced plastic composite articles, comprising the steps of:

- a) providing:
 - i) a hollow preform comprised of a plurality of discrete reinforcing fibers intimately intermixed with a plurality of discrete ~~a thermoplastic material~~ fibers, said preform having a cylindrical sidewall portion, a domed bottom portion, and a domed top portion, and
 - ii) a rigid mold having a cylindrical sidewall portion and domed end portions corresponding to said preform portions;
- b) positioning said preform against the inner surface of said corresponding mold portions;
- c) compressing said preform with an internally pressurized, inflatable core having a cylindrical sidewall portion, and top and bottom dome portions to hold said preform in place;
- d) heating said preform to a temperature sufficient to melt said thermoplastic fibers ~~material~~ while the pressure in said inflatable core compresses said preform and ~~maintains the distribution of the~~ distributes thermoplastic material from said thermoplastic fibers throughout said preform to provide a fiber reinforced molded article;
- e) cooling said molded article until said-thermoplastic material is substantially solid;

- f) reducing the pressure in said inflatable core; and
- g) removing said molded article from said mold.

Claim 2 (currently amended): The method of claim 1 wherein the pressure in said inflatable core is increased during the heating step to compress said preform[[s]] and maintain the distribution of thermoplastic material throughout said preform, whereby voids in the fiber reinforced molded article may be further reduced.

Claim 3 (original): The method of claim 1 wherein said hollow preform comprises a separately preformed sidewall portion and integrated bottom portion and a separately preformed top dome portion.

Claim 4 (original): The method of claim 1 wherein said hollow perform comprises a separately preformed cylindrical sidewall portion and comprises separately preformed domed portions.

Claim 5 (previously presented): The method of claim 4 wherein the separately preformed domed portions are comprised of filament wound isotenoid portions.

Claim 6 (original): The method of claim 5 wherein the sidewall portions overlap the domed portions.

Claim 7 (original): The method of claim 4 wherein said cylindrical sidewall portion is formed from a rectangular blanket of said reinforcing fibers intimately intermixed with

said thermoplastic material, said blanket being positioned against said cylindrical sidewall portion of the mold with a slight overlap of opposite ends of said blanket.

Claim 8 (original): The method of claim 1 wherein the ratio of reinforcing fiber to thermoplastic material is substantially constant throughout said preform.

Claim 9 (original): The method of claim 8 wherein said ratio is approximately 3:2.

Claim 10 (previously presented): The method of claim 1 wherein the ratio of reinforcing fiber to thermoplastic material varies within said preform.

Claim 11 (original): The method of claim 1 wherein the wall thickness of said preform is substantially constant.

Claim 12 (original): The method of claim 1 wherein the wall thickness of said preform varies along its length.

Claim 13 (original): The method of claim 1 wherein said reinforcing fibers are glass fibers.

Claim 14 (original): The method of claim 13 wherein said glass fibers are approximately 1 inch in length.

Claim 15 (original): The method of claim 1 wherein said thermoplastic material is chosen from the group comprised of:

polypropylene, polyethylene, polybutylene terephthalate, polyethylene terephthalate, and nylon.

Claim 16 (original): The method of claim 1 further comprising, prior to said compressing, the step of treating the outer surface of said inflatable core with an adhesive agent so that said core is bonded to the interior of said molded article.

Claim 17 (original): The method of claim 1 further comprising, prior to said compressing, the steps of:

treating a surface of one of the top and bottom dome portions and an adjacent sidewall portion of said inflatable core with an adhesive agent to provide an adhesive coated portion; and

treating a surface of another of said top and bottom dome portions and an adjacent sidewall portion with a releasing agent to provide a release coated portion; and, after said removing, the step of:

disengaging the release coated portion of said inflatable core from an inner surface of said molded article while the adhesive coated portion remains adhered to an inner surface of said molded article.

Claim 18 (original): The method of claim 1 further comprising, prior to said compressing, the step of treating the outer surface of said inflatable core with a releasing agent; and, after removing said molded article from the mold, the step of removing said inflatable core from said molded article.

Claim 19 (original): The method of claim 1 wherein said temperature is approximately 400 °F and maintaining said temperature for a period of at least approximately 30 minutes.

Claim 20 (original): The method of claim 2 wherein said pressure is increased to approximately 2530 psi.

Claim 21 (original): The method of claim 1 wherein said thermoplastic material is in fibrous form.

Claim 22 (original): The method of claim 19 wherein said fibrous form is approximately 2 inch lengths of thermoplastic material.

Claim 23 (original): The method of claim 1 wherein said thermoplastic material is provided in particulate form.

Claim 24 (original): The method of claim 1 wherein said inflatable core is a neoprene bladder.

Claim 25 (original): The method of claim 1 further comprising the step of connecting said mold to a source of vacuum during the heating step to further reduce the incidence of voids in the finished article.

Claim 26 (original): The method of claim 2 further comprising the step of connecting said mold to a source of vacuum during the heating step to further reduce the incidence of voids in the finished article.

Claim 27 (Currently amended): A method of making hollow, reinforced plastic composite articles, comprising the steps of:

a) providing:

i) a hollow preform comprised of a plurality of discrete reinforcing fibers intimately intermixed with a plurality of discrete thermoplastic fibers, material, said preform having a cylindrical sidewall portion, a domed bottom portion, and a domed top portion;

ii) a hollow plastic liner within said preform, said liner having a cylindrical sidewall portion, a domed bottom portion, and a domed top portion; and

iii) a rigid mold having a cylindrical sidewall portion and domed end portions corresponding to said preform portions;

b) positioning said preform against the inner surface of said corresponding mold portions;

c) heating said preform sufficient to melt said thermoplastic fibers material and distribute the thermoplastic material from the thermoplastic fibers throughout said preform to provide a fiber reinforced molded article;

d) cooling said molded article until said thermoplastic material is substantially solid; and

e) removing said molded article from said mold.

Claim 28 (original): The method of claim 27 wherein said plastic liner is a thermoplastic liner.

Claim 29 (original): The method of claim 27 further comprising, during said heating, the step of pressurizing the plastic liner with a gas or a fluid; and prior to removing said molded article from the mold, the step of reducing the pressure in said plastic liner.

Claim 30 (original): The method of claim 29 further comprising, during said heating, the step of connecting said mold to a source of vacuum during the pressurizing step to further reduce the incidence of voids in the finished article.

Claim 31 (original): A method of making hollow, reinforced plastic composite articles, comprising the steps of:

- a) providing:
 - i) a hollow preform of glass reinforcing fibers approximately one inch long intimately intermixed with thermoplastic fibers approximately two inches long, wherein the ratio of glass fibers to resin fibers is approximately 3:2 uniformly throughout said preform, said preform having a cylindrical sidewall portion, a domed bottom portion, and a domed top portion, and
 - ii) a rigid mold having a cylindrical sidewall portion and domed end portions corresponding to said preform portions;
- b) positioning said preform against the inner surface of said corresponding mold portions;
- c) compressing said preform with an internally pressurized, flexible inflatable core having a

cylindrical sidewall portion, and top and bottom dome portions to hold said preform in place;

d) heating said preform to approximately 400 degrees F while maintaining that temperature for between 20 and 60 minutes, while also increasing the pressure in said inflatable core to approximately 25-30 psi to compress said preform and maintain the distribution of the thermoplastic material throughout said preform to provide a substantially void free fiber reinforced molded article;

e) cooling said molded article until said thermoplastic material is substantially solid;

f) reducing the pressure in said inflatable core;

g) removing said molded article from said mold;

and

h) removing said inflatable core from the molded article.

Claim 32 (previously presented): The method of claim 31 further comprising the step of connecting said mold to a source of vacuum during said heating to further reduce the incidence of voids in the finished article.

Claim 33 (currently amended): A method of making hollow, reinforced plastic composite articles, comprising the steps of:

a) providing:

i) a hollow preform of glass reinforcing fibers intermixed with thermoplastic material, said preform having a filament wound cylindrical sidewall portion, a filament wound domed bottom portion, and a filament wound

domed top portion, wherein said cylindrical sidewall portion overlaps each geodesic domed portion; and

ii) a rigid mold having a cylindrical sidewall portion and domed end portions corresponding to said preform portions;

b) positioning said preform against the inner surface of said corresponding mold portions;

c) compressing said preform with an internally pressurized, flexible inflatable core having a cylindrical sidewall portion, and top and bottom dome portions to hold said preform in place;

d) heating said preform to approximately 400 degrees F while maintaining that temperature for between 20 and 60 minutes, while also increasing the pressure in said inflatable core to approximately 25-30 psi to compress said preform and maintain the distribution of the thermoplastic material throughout said preform to provide a substantially void free fiber reinforced molded article;

e) cooling said molded article until said thermoplastic material is substantially solid;

f) reducing the pressure in said inflatable core;

g) removing said molded article from said mold; and

h) removing said inflatable core from the molded article.

Claim 34 (previously presented): The method of claim 33 further comprising the step of connecting said mold to a source of vacuum during said heating to further reduce the incidence of voids in the finished article.

Claim 35 (new): A method of making hollow, reinforced plastic composite articles, comprising the steps of:

- a) providing:
 - i) a hollow preform comprised of a plurality of discrete reinforcing fibers intimately intermixed with a thermoplastic material, said preform having a cylindrical sidewall portion, a domed bottom portion, and a domed top portion, and
 - ii) a rigid mold having a cylindrical sidewall portion and domed end portions corresponding to said preform portions;
- b) positioning said preform against the inner surface of said corresponding mold portions without a prior winding step;
- c) compressing said preform with an internally pressurized, inflatable core having a cylindrical sidewall portion, and top and bottom dome portions to hold said preform in place;
- d) heating said preform to a temperature sufficient to melt said thermoplastic material while the pressure in said inflatable core compresses said preform and maintains the distribution of the thermoplastic material throughout said preform to provide a fiber reinforced molded article;
- e) cooling said molded article until said thermoplastic material is substantially solid;
- f) reducing the pressure in said inflatable core; and
- g) removing said molded article from said mold.

Claim 36 (new): A method of making hollow, reinforced plastic composite articles, comprising the steps of:

- a) providing:
 - i) a discrete cylindrical sidewall portion, a discrete domed bottom portion, and a discrete domed top portion;
 - ii) a rigid mold having a cylindrical sidewall portion and domed end portions corresponding to said preform portions; and
 - ii) a flexible, inflatable core;
- b) positioning said discrete cylindrical sidewall portion, said discrete domed bottom portion, and said discrete domed top portion against the inner surface of said corresponding mold portions such that said cylindrical sidewall portion overlaps each domed portion to form a preform having said core inserted into an interior of said preform;
- c) inflating said core for compressing and pressurizing said preform to hold said preform in place;
- d) heating and pressurizing said preform for a period of time to compress said preform and maintain the distribution of the thermoplastic material throughout said preform to provide a substantially void free fiber reinforced molded article;
- e) cooling said molded article until said thermoplastic material is substantially solid;
- f) reducing the pressure in said inflatable core;
- g) removing said molded article from said mold; and
- h) removing said inflatable core from the molded article.

Claim 37 (new) The method of claim 36, wherein one or more of said discrete cylindrical sidewall portion, said discrete domed bottom portion, and said discrete domed top portion are comprised of a plurality of discrete reinforcing fibers intimately intermixed with a plurality of discrete thermoplastic fibers.